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10/714,202	11/14/2003	Thomas Duda	068758.0143	2672

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EXAMINER	
BOLOURCHI, NADER	
ART UNIT	**PAPER NUMBER**
2611	
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07/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/714,202	DUDA ET AL.	
	Examiner	Art Unit	
	Nader Bolourchi	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,13,15,16,19-25 and 28-30* is/are rejected.

7)☒ Claim(s) *11,12,14,17,18,26 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/14/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

2. Acknowledgment is made of applicant's claim for foreign priority filed in Germany on 05/17/2001 under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 11/14/2007 have been considered and made of record by the examiner.

Drawings

4. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance

Specification

5. The disclosure is objected to because of the following informalities:

In page 3, line 11, replace number "38" with number - - 39 - -. In page 3, line 12, replace numbers "39" and "35" with numbers - - 38 - -; and - - 37 - -, as per Fig. 2, respectively.

In line 3 of page 5, term "possibility" is vague". It is recommended to delete phrase "the possibility of" in lines 3 and 4 of page 5.

Appropriate correction is required.

Claim Objections

6. Claim 1 are objected to because of the following informalities: In claim 1, line 1, replace phrase "a signal" with phrase - - an analog signal - - , as recited in line 6 of claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112, second paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 10, it recites the limitation "low-pass filtering" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

8. Claims 1-2, 4-5, 15-16, 19-20, and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 2, it recites "the analog/digital converter oversamples the supplied data signal n-times in order to transform low-frequency noise into a higher-frequency spectrum, particularly above the symbol rate" (lines 1-3), which term "particularly above the symbol rate" makes it vague and unclear. It is not clear what term "particularly above the symbol rate" is referring to.

Regarding claim 4, it recites "at least a factor of m=2, better by a factor of 5-10 or more" (lines2-3), which term "better by a factor of 5-10 or more" makes it vague and unclear. It is not clear what term "better by a factor of 5-10 or more" is referring to.

Regarding claim 5, it recites "filtering of low-frequency components below a predetermined lower cut-off frequency, particularly of direct-current components" (lines 1-3), which term "particularly of direct-current components" makes it vague and unclear. It is not clear what term "particularly of direct-current components" is referring to.

Regarding claim 9, it recites, "a high-pass filter is provided for filtering low-frequency components below a predetermined lower cut-off frequency, particularly of direct-current components" (lines 1-3), which term "particularly of direct-current components" makes it vague and unclear. It is not clear what term "particularly of direct-current components" is referring to.

Regarding claim 16, it recites "the analog/digital converter oversamples the analog data signal n-times in order to transform low-frequency noise into a high-frequency spectrum, particularly above the symbol rate" (lines 1-3), which term "particularly above the symbol rate" makes it vague and unclear. It is not clear what term "particularly above the symbol rate" is referring to.

Regarding claim 19, it recites, "a high-pass filter is provided for filtering low-frequency components below a predetermined lower cut-off frequency, particularly of direct-current components" (lines 1-3), which term "particularly of direct-current components" makes it vague and unclear. It is not clear what term "particularly of direct-current components" is referring to.

Regarding claim 20, it recites, "a digital cable approximation filter, particularly a FIR filter, is provided for signal equalization" (lines 1-2), which term "particularly a FIR filter" makes it vague and unclear. It is not clear what term "particularly a FIR filter" is referring to.

Claims 1 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are:

Regarding claim 1, it is not clear from the claim language, what the relationship between steps of amplifying, filtering discretizing and performing is.

Regarding claim 15, it is also not clear from the claim language, how amplifier, low-pass filter, analog/digital converter, and digital cable approximation are connected and work together.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-9, 13, 15-16, 19-25, and 28-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmori et al. (US 6,130,793).

Regarding claim 1, Ohmori et al. disclose a method for reconstructing data, clocked at a symbol rate, from a signal which has been distorted and attenuated by transmission of a transmission link (see Fig. 2 described in col. 4: line 57 to col. 6: line 35), comprising the following steps: a) amplifying (Fig. 2: 41) the signal (Fig. 2: HEAD2) amplitude attenuated by the transmission (col. 5: lines 7-9; Examiner notes that the signal corresponds to transmitted data from the disk and received by a receiver, i.e., HEAD 2); b) filtering high-frequency interference frequencies (Fig. 2: 42) above the symbol rate (col. 6: lines 26-30); c) discretizing the analog signal by means of an oversampled analog/digital converter (Fig. 2: 43); d) performing a cable approximation by means of a

digitally implemented cable approximation filter (Fig. 2: 47) in order to obtain an equalized signal (see Digital Equalizer in Figs. 2, 11, and 12; col. 5: lines 39-40). However, Ohmori is silent about interpolating and decimating filter, when disclose use of PLL (col. 2: lines 4-38; Examiner notes that PLL inherently includes a filter known as loop filter). However interpolating and decimating are also known as upsampling and downsampling, which in general cancel each other's effect. Applicant does not claim any distinction between these two reverse actions of up sampling and downsampling. One ordinary skill in the art, would have expected Applicant's invention to perform equally well without use of interpolating and decimating filters, because they cancel each other effects.

Regarding claim 2, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. furthermore disclose that the analog/digital converter oversamples the supplied data signal n-times (col. 5: lines 14-18; Fig. 4: 432) in order to transform low-frequency noise into a higher-frequency spectrum, particularly above the symbol rate (col. 6: lines 26-30).

Regarding claim 3, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. furthermore disclose that the step of filtering of high-frequency interferers is performed by means of a digital filter, which is arranged between the analog/digital converter and the cable approximation filter (Fig: 2: 44 which is located between 43 and 47).

Regarding claim 4, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. is silent about decimating the signal. However, reducing data rate by any factor to obtain the decimated signal is the definition of decimation, as disclosed by Wikipedia (http://en.wikipedia.org/wiki/Decimation_%28signal_processing%29). Therefore, It would have been obvious to one of ordinary skill in the art, at the time the invention was made to combine the teaching of Ohmori et al. and Wikipedia for the purpose of reducing number of samples in a discrete-time signal as suggested by Wikipedia (line 5).

Regarding claim 5, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. further disclose the step of filtering of low-frequency components below a predetermined lower cut-off frequency, particularly of direct-current components, by means of a digital filter (col. 6: lines 26-30).

Regarding claim 6, Ohmori et al. disclose as stated in rejection if claim 5. Ohmori et al. further disclose that the low-frequency components are filtered before the cable approximation is performed ((Fig: 2: 44 located before 47).

Regarding claim 7, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. does not explicitly disclose that the cable approximation filter (Fig. 2: 47) is a digital FIR filter. At the time the invention was made, it would have been to a person of ordinary skill in the art to use any digital filter as the cable approximation filter. Applicant has not

disclosed that use of FIR filter provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the digital filter disclosed by Ohmori because it is a cable approximation filter. Therefore, it would have been obvious to one of ordinary skill in this art to modify Ohmori et al to obtain the invention as specified in claim.

Regarding claim 8, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. amplification of the signal amplitude and the cable approximation is controlled by a digitally implemented equalizer control unit (see digital equalizer in Figs. 2, 11, and 12).

Regarding claim 9, Ohmori et al. disclose as stated in rejection if claim 1. Ohmori et al. also disclose the memory devices, (registers in col. 10: lines 1-21), however they do not explicitly disclose memory for storing coefficients. However, use of memory for storing filter coefficient is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use memory device to store coefficient since it was known in the art that registers are memory devices.

Regarding claim 13, Ohmori et al. disclose as stated in rejection if claim 1. Furthermore, Ohmori et al. disclose use of PLL (col. 2: lines 4-38; Examiner notes that the clock control characteristic of the phase-locked loop is inherently adjusted by means of a timing loop filter).

Regarding claim 15, Ohmori et al. disclose a device for reconstructing data clocked at a symbol rate from an analog signal which has been distorted and attenuated by transmission of a transmission link (see Fig. 2 described in col. 4: line 57 to col. 6: line 35) comprising the following: a) an amplifier (Fig. 2: 41) for amplifying the signal (Fig. 2: HEAD2) amplitude attenuated by the transmission (col. 5: lines 7-9; Examiner notes that the signal corresponds to transmitted data from the disk and received by a receiver, i.e., HEAD 2); b) a low-pass filter for filtering high-frequency interferers (Fig. 2: 42) above the symbol rate (col. 6: lines 26-30); c) an analog/digital converter for discretizing the analog signal (Fig. 2: 43); d) a digital cable approximation filter (Fig. 2: 47) for generating an essentially equalized, discrete signal (see Digital Equalizer in Figs. 2, 11, and 12; col. 5: lines 39-40); Ohmori is silent about interpolating and decimating filter, when disclose use of PLL (col. 2: lines 4-38; Examiner notes that PLL inherently includes a filter known as loop filter). However interpolating and decimating are also known as upsampling and downsampling, which in general cancel each other's effect. Applicant does not claim any distinction between these two reverse actions of up sampling and downsampling. One ordinary skill in the art, would have expected Applicant's invention to perform equally well without use of interpolating and decimating filters, because they cancel each other effects.

Regarding claim 16, Ohmori et al. disclose as stated in rejection if claim 15. Ohmori et al. further disclose that the analog/digital converter oversamples the analog data signal

n-times (col. 5: lines 14-18; Fig. 4: 432) in order to transform low-frequency noise into a high-frequency spectrum, particularly above the symbol rate (col. 6: lines 26-30).

Regarding claim 19, Ohmori et al. disclose as stated in rejection if claim 15. Ohmori et al. further disclose a high-pass filter is provided for filtering low-frequency components below a predetermined lower cut-off frequency, particularly of direct-current components (col. 6: lines 26-30).

Regarding claim 20, Ohmori et al. disclose as stated in rejection if claim 15. Furthermore, Ohmori et al. disclose a digital cable approximation filter provided for signal equalization (see digital equalizer in Figs. 2, 11, and 12).

Regarding claim 21, Ohmori et al. disclose as stated in rejection if claim 20. Ohmori et al. also disclose an equalizer control unit is provided for controlling the setting of the amplifier and the characteristic of the cable approximation filter (Fig. 2: 46 and 48).

Regarding claim 22, Ohmori et al. disclose as stated in rejection if claim 21. Ohmori et al. also disclose the memory devices, (registers in col. 10: lines 1-21), however they do not explicitly disclose memory for storing coefficients. However, use of memory for storing filter coefficient is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use memory device to store coefficient since it was known in the art that registers are memory devices

Regarding claim 23, Ohmori et al. disclose a device for reconstructing data clocked at a symbol rate from an analog signal which has been distorted and attenuated by transmission of a transmission link (see Fig. 2 described in col. 4: line 57 to col. 6: line 35), comprising the following: a) an amplifier (Fig. 2: 41) receiving a signal (Fig. 2: HEAD2)and generating an amplified signal (col. 5: lines 7-9; Examiner notes that the signal corresponds to transmitted data from the disk and received by a receiver, i.e., HEAD 2); b) a low-pass filter receiving the amplified signal and generating a filtered signal (Fig. 2: 42); c) an analog/digital converter receiving the filtered signal and generating a digital signal (Fig. 2: 43); d) a digital cable approximation filter (Fig. 2: 47) receiving the digital signal and generating an equalized digital signal (see Digital Equalizer in Figs. 2, 11, and 12; col. 5: lines 39-40); Ohmori is silent about interpolating and decimating filter, when disclose use of PLL (col. 2: lines 4-38; Examiner notes that PLL inherently includes a filter known as loop filter). However interpolating and decimating are also known as upsampling and downsampling, which in general cancel each other's effect. Applicant does not claim any distinction between these two reverse actions of up sampling and downsampling. One ordinary skill in the art, would have expected Applicant's invention to perform equally well without use of interpolating and decimating filters, because they cancel each other effects.

Regarding claim 24, Ohmori et al. disclose as stated in rejection if claim 23. Ohmori et al. furthermore disclose that the analog/digital converter oversamples the analog data

signal n-times (col. 5: lines 14-18; Fig. 4: 432) in order to transform low-frequency noise into a high-frequency spectrum, particularly above the symbol rate (col. 6: lines 26-30).

Regarding claim 25, Ohmori et al. disclose as stated in rejection if claim 23. Ohmori et al. furthermore disclose a digital low-pass filter coupled between said analog/digital converter and said digital cable approximation filter (Fig: 2: 44 which is located between 43 and 47).

Regarding claim 28, Ohmori et al. disclose as stated in rejection if claim 23. Ohmori et al. does not explicitly disclose that the cable approximation filter (Fig. 2: 47) is a digital FIR filter. At the time the invention was made, it would have been to a person of ordinary skill in the art to use any digital filter as the cable approximation filter. Applicant has not disclosed that use of FIR filter provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the digital filter disclosed by Ohmori because it is a cable approximation filter. Therefore, it would have been obvious to one of ordinary skill in this art to modify Ohmori et al to obtain the invention as specified in claim.

Regarding claim 29, Ohmori et al. disclose as stated in rejection if claim 23. Ohmori et al. also disclose an equalizer control unit coupled with the amplifier and the cable approximation filter(Fig. 2: 46 and 48).

Regarding claim 30, Ohmori et al. disclose as stated in rejection if claim 23. Ohmori et al. also disclose the memory devices, (registers in col. 10: lines 1-21), however they do not explicitly disclose memory for storing coefficients. However, use of memory for storing filter coefficient is well known in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use memory device to store coefficient since it was known in the art that registers are memory devices.

Allowable Subject Matter

11. Claims 11-12, 14, 17-18, and 26-27 is/are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Remarks

14. No claim is allowed.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Copeland (US 6,067,319).

Contact Information

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nader Bolourchi whose telephone number is (571) 272-8064. The examiner can normally be reached on M-F 8:30 to 4:30.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David. C. Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

Nader Bolourchi
7/5/2007
Art Unit 2611

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER